

CLAIMS

1. A power management unit (40) for a portable
5 electronic apparatus, which is powered by at least a
battery (42), the power management unit being implemented
as an integrated circuit, c h a r a c t e r i z e d in
that the power management unit comprises at least one of:
a general purpose analog-to-digital converter block
10 (57) comprising a first switch (573) for selecting one of
at least two analog input signals, and an analog-to-
digital converter (571) which is arranged to convert said
selected analog input signal into a digital signal;
an analog event generator block (52), which is
15 arranged to provide an indication for controlling an
operating state of said power management unit when a
third analog input signal assumes a predetermined
relation to a predetermined reference value;
a timer block (54), which is operable for providing
20 a timing signal independently of which one of a plurality
of operating states the power management unit is operable
in; and
a battery charge control block (53), which is
capable of controlling a battery charge current based on
25 an estimated charge power.
2. The power management unit as claimed in claim 1,
c h a r a c t e r i z e d in that the power management
unit comprises said general purpose analog-to-digital
converter block (57), wherein one of said at least two
30 analog input signals represents a temperature, a force, a
pressure, a battery charge current, a battery voltage or
an input voltage.
3. The power management unit as claimed in claim 1
or 2, c h a r a c t e r i z e d in that the power
35 management unit comprises said general purpose analog-to-
digital converter block (57), wherein the general purpose
analog-to-digital converter block comprises task list

means, indicative of a sequence in which said at least two analog input signals are to be processed by said analog-to-digital converter, whereby said first switch is controlled according to said task list means.

5 4. The power management unit as claimed in claim 3, characterized in that said task list means is programmable for providing a desired sequence in which said at least two analog input signals are to be processed by said analog-to-digital converter.

10 5. The power management unit as claimed in any one of the preceding claims, characterized in that the power management unit comprises said general purpose analog-to-digital converter block (57), wherein the general purpose analog-to-digital converter block
15 comprises averaging means (572) for providing an average of said digital signal.

 6. The power management unit as claimed in any one of the preceding claims, characterized in that the power management unit comprises said general
20 purpose analog-to-digital converter block (57), wherein the general purpose analog-to-digital converter block comprises storage means for storing said digital signal or said average of said digital signal.

 7. The power management unit as claimed in claim 6,
25 characterized in that the general purpose analog-to-digital converter block comprises a second switch (574) for selecting one of at least two storage areas in said storage means, in which said average of said digital signal is to be stored.

30 8. The power management unit as claimed in any one of the preceding claims, characterized in that the power management unit comprises said general purpose analog-to-digital converter block (57), wherein the general purpose analog-to-digital converter block
35 comprises means (575) for receiving a measurement request, comprising an indication of a prioritized one of said at least two analog input signals, and means for

controlling said first switch such as to bypass said task list means.

9. The power management unit as claimed in claim 8, c h a r a c t e r i z e d in that the power management
5 unit is arranged for receiving said measurement request from a processor (20).

10. The power management unit as claimed in any one of the preceding claims, c h a r a c t e r i z e d in that the power management unit comprises said general
10 purpose analog-to-digital converter block (57), wherein at least one of said first and said second switch comprises a multiplexer (573) or a de-multiplexer, respectively (574).

11. The power management unit as claimed in any one
15 of the preceding claims, c h a r a c t e r i z e d in that the power management unit comprises said analog event generator block (52), wherein said indication causes a control block (49) to shift from a first of said plurality of operating states to a second of said
20 plurality of operating states.

12. The power management unit as claimed in claim 11, c h a r a c t e r i z e d in that said third analog input signal represents a temperature, a force, a pressure, a battery charge current, a battery voltage or
25 an input voltage.

13. The power management unit as claimed in claim 11 or 12, c h a r a c t e r i z e d in that the analog event generator block comprises an analog signal input, a reference signal input and a comparator (522) for
30 comparing said third analog signal and said reference signal, whereby said indication is provided based on said comparison.

14. The power management unit as claimed in claim 13, c h a r a c t e r i z e d in that the analog event
35 generator block comprises delay means (523) for eliminating rapid changes of said an output signal providing said indication.

15. The power management unit as claimed in claim 13, characterized in that the analog event generator block is arranged for receiving said predetermined reference value in digital form, to convert said reference value into an analog form, which is provided said comparator (522).

16. The power management unit as claimed in any one of claims 11-15, characterized in that the power management unit is arranged to shift from an essentially passive operating state into an essentially active operating state based on said indication.

17. The power management unit as claimed in any one of claims 11-16, characterized in that the power management unit is arranged to at least partially power up the portable electronic apparatus based on said indication.

18. The power management unit as claimed in any one of the preceding claims, characterized in that the power management unit comprises said timer block (54), wherein the timer block is arranged to provide a time indication based on said timing signal.

19. The power management unit as claimed in claim 18, characterized in that the timer block is arranged to provide an alarm signal when said time indication coincides with a predetermined time.

20. The power management unit as claimed in claim 18 or 19, characterized in that the power management unit is arranged to shift, in response to said alarm signal, from a first of said plurality of operating states to a second of said plurality of operating states.

21. The power management unit as claimed in any one of claims 18-20, characterized in that the timer block comprises an oscillator (542, 543) for providing said timing signal.

22. The power management unit as claimed in any one of claims 18-20, characterized in that the timer block is arranged to receive an oscillator signal

from an external unit (47), whereby the timing signal is based on said oscillator signal.

23. The power management unit as claimed in claim 1, c h a r a c t e r i z e d in that the power management
5 unit comprises said battery charge control block (53), wherein said measured charge power is determined based on the estimated charge current and on the measured charge voltage.

24. The power management unit as claimed in claim
10 23, c h a r a c t e r i z e d in that the power management unit comprises said battery charge control block (53), wherein said measured charge current and said measured charge voltage are provided to a processor (20).

25. The power management unit as claimed in claim
15 24, c h a r a c t e r i z e d in that the power management unit comprises said battery charge control block (53), wherein a desired charge current is indicated by said processor (20).

26. The power management unit as claimed in any one
20 of claims 23-25, c h a r a c t e r i z e d in that the power management unit comprises said battery charge control block (53), wherein a desired battery voltage is indicated by said processor (20).

27. An electronic pen, comprising an image sensor
25 (10) for recording a position coding pattern on a base on which information is written down using the electronic pen, and a processor (20) for processing information received from said image sensor,
c h a r a c t e r i z e d in that the electronic pen
30 comprises a power management unit (40) according to any one of the preceding claims.

28. The power management unit as claimed in claim 1,
c h a r a c t e r i z e d by a test block (58)
comprising a second test multiplexer (582), which is
35 arranged for subjecting one of a plurality of test points (586) to a load, and a first test multiplexer (581) which is arranged for selecting one of said plurality of test

points (586) and for providing an analog test signal from said selected test point to said general purpose analog-to-digital converter (57).

29. The power management unit as claimed in claim
5 28, c h a r a c t e r i z e d in that said one of said plurality of test points (586) which is subjected to said load is identical to said one of said plurality of test points which is selected by said first test multiplexer (581).